

1

This brief contains these items under the following headings, and in the order set forth below:

- I. Real Party In Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Claimed Subject Matter
- VI. Grounds for Rejection to be Reviewed on Appeal
- VII. Argument
- VII. Claims Appendix

The final page of this brief bears the practitioner's signature.

### **REAL PARTY IN INTEREST**

The real party in interest in this appeal is John R. Jamison, the inventor.

### **RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences that will directly affect, be directly affected by, or have a bearing on, the Board's decision in this appeal.

### **STATUS OF CLAIMS**

#### **A. TOTAL NUMBER OF CLAIMS IN APPLICATION**

There are 37 currently pending claims in the application.

**B. STATUS OF ALL THE CLAIMS**

Claims canceled: 11, 18.  
Claims withdrawn: none  
Claims pending: 1-10, 12-17, 19-39.  
Claims allowed: None  
Claims rejected: 1-10, 12-17, 19-39.

**C. CLAIMS ON APPEAL**

1-10, 12-17 and 19-39 are on appeal.

**STATUS OF AMENDMENTS**

No amendment was filed after final rejection.

**SUMMARY OF CLAIMED SUBJECT MATTER**

The claimed subject matter is generally directed to an ultra-short, high-power cartridge, and a short-action firearm for matingly chambering the cartridge. At page 9, lines 14-35, the limits on cartridge powder capacity and the resultant low-power performance of previous short-action cartridges is discussed. This patent application discloses solutions to this problem, not only for a cartridge of normal short-action length depicted in FIG. 8, but for an even shorter, or “ultra-short,” cartridge as shown in FIG. 9 which enables even shorter-action firearms. All of the claims herein are limited to the “ultra-short” cartridge or firearm.

A first embodiment of the claimed subject matter relates to the ultra-short cartridge as generally disclosed in FIG. 9 and the accompanying portions of the specification from page 10, line 17 to page 11, line 33. According to independent claim 22, the cartridge 118 has a projectile 118b with a diameter within a range from 0.22 to 0.30 inch and an elongate tubular case 118a capable of operably withstanding, and having sufficient propellant to fire at, an internal gas

pressure of at least 50,000 pounds per square inch while chambered. The cartridge 118 has an overall length  $L$  between a first end that defines a substantially circular base 122 with an annular rim 124 and groove 125, and a second end that defines a mouth 126 for insertably receiving the projectile 118b. Adjacent the first end is a substantially cylindrical first portion 128, and adjacent the second end is a narrower substantially cylindrical second portion 130, the first and second portions being interconnected by a shoulder portion 132. At the interconnection between the first portion 128 and the shoulder portion 132, the first portion 128 has a diameter  $D$  of at least about 0.53 inch, and the ratio of the overall length  $L$  of the cartridge to the first portion diameter  $D$  is no more than about 3.5. The first portion 128 has a first portion length  $L'$  extending between the first end 122 and the shoulder portion 132, and the first portion length  $L'$  has a ratio to the first portion diameter  $D$  of no more than about 3.

According to independent claim 32, and with reference to FIG. 9 and the specification at page 11, line 34 to page 12, line 12, the cartridge 118 has the same projectile, propellant, pressure capacity and shape ratios as in claim 22, but the magnitude of the previously specified first portion diameter  $D$  is replaced by a rim 124 diameter greater than 0.5 inch, and the shape is further specified to have no protrusion radially beyond the first portion 128 of the case.

A second embodiment of the claimed subject matter relates to the ultra-short action firearm for matingly receiving the cartridge of FIG. 9 and is generally disclosed in FIGS. 1, 2A, 5, and 6 of the present application with reference to the accompanying portions of the specification from page 4, line 14, to page 5, line 15, and page 13, line 27 to page 14, line 11. According to independent claim 1, the firearm 10 has tubular chamber 16 and a bolt 12, selectively slidable longitudinally in a sliding direction between a retracted unlocked position and an extended locked position. The bolt provides a locked bolt face 12a when in the locked position 36 (FIG. 2A). The chamber 16 has a first end 38 adjacent to the locked bolt face position 36 and a second end 40 defined by a case mouth recess sized for operably receiving a cartridge with a projectile of a

specific diameter within a range from 0.22 to 0.30 inch. The chamber 16 is capable of withstanding internal gas pressures of at least about 65,000 psi and is sized to matingly engage the cartridge so as to enable the cartridge to fire in the chamber 16 with sufficient propellant to produce an internal gas pressure of at least 50,000 psi, and to operably withstand that pressure. The bolt is capable of inserting the cartridge into the chamber 16. The chamber 16 is shaped to matingly receive a cartridge as shown in FIG. 9, and thus has a first portion of substantially cylindrical shape adjacent to the first end 38, a second portion of a narrower substantially cylindrical shape adjacent to the second end 40, and a shoulder portion interconnecting the first portion and the second portion. The chamber 16 has an overall length measured from the locked bolt face position 36 to the second end 40 of the chamber. The first portion has a first portion inner diameter of at least about 0.53 inch at the interconnection of the first portion and the shoulder portion. The overall length of the chamber 16 has a ratio to the first portion inner diameter of no more than about 3.5 at the intersection of the first portion and the shoulder portion. The first portion has a first portion length extending between the locked bolt face 12a and the shoulder portion, and the first portion length has a ratio to the first portion inner diameter of no more than about 3 at the intersection of the first portion and the shoulder portion. The chamber 16 is sized for operably receiving a cartridge free of any protrusion on the cartridge extending radially outwardly beyond the cylindrical shape of the first portion of the chamber.

According to independent claim 12, which in addition to the portions of the specification described in the preceding paragraph, is further described at p. 15 lines 6-35 and p. 12 lines 2-3, the firearm has a chamber sized as described in claim 1, except that the previously specified magnitude of the first portion inner diameter of the chamber is replaced by an extractor 44 sized for operably gripping a rim 124 having a diameter greater than 0.5 inch.

### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

The grounds of rejection presented for review are: (1) whether claims 1-8, 12-17, 19, and 22-39 are unpatentable under 35 U.S.C. 103(a) as being obvious over the combination of the 0.50 -95 Winchester as disclosed by Frank C. Barnes, CARTRIDGES OF THE WORLD, Follet Publishing Co. 1965 at page 116 (hereinafter "Barnes") in view of Rick Jamison, "Precision Reloading", SHOOTING TIMES (Jan. 1996) (hereinafter "Jamison"); and (2) whether claims 9, 10, 20, and 21 are unpatentable under 35 U.S.C. Section 103(a) as being obvious over Barnes in view of Jamison and in further view of Schuerman, U.S. Patent No. 4,920,677.

### **ARGUMENT**

#### **REJECTION UNDER 35 U.S.C. 103(a) OVER BARNES IN VIEW OF JAMISON**

##### **GROUP I – Claims 22-39**

All of the claims of Group I claim a cartridge having a number of specified structural limitations summarized as follows:

- (a) the cartridge must include a projectile (bullet) with a specific diameter within a range from 0.22 to 0.30 inch;
- (b) the cartridge must include an elongate tubular case having a specified shape and dimensions, including an annular groove at its base;
- (c) the case must be capable of operably withstanding, and have sufficient propellant (powder) to fire at, internal gas pressures of at least about 50,000 psi when fired in a mating firearm chamber.

The Examiner rejected the claims of Group I under 35 U.S.C. § 103(a) as being obvious over the Barnes .50-95 Winchester cartridge in view of Jamison. The Examiner contends that Barnes discloses a .50-95 Winchester cartridge having the claimed dimensions. This is incorrect

because Barnes discloses a much larger projectile diameter of 0.513 inch, and no annular groove at the base of the cartridge, thereby failing to satisfy limitations (a) and (b) above.

Moreover, Barnes discloses a Winchester .50-95 cartridge that is not capable of either producing or withstanding internal gas pressures of at least 50,000 psi, as required by limitation (c) above. Specifically, Barnes states that the manufacturer advises that the cartridge be used with “*black powder or low pressure smokeless loads.*” See Barnes at p. 116. Jamison, the author of the Examiner’s secondary reference, submitted on December 30, 2004 a Declaration under Rule 132 stating that the .50-95 Winchester is a nineteenth century cartridge incapable of safely withstanding internal gas pressures in excess of 28,000 psi because it utilizes a folded head design, and confirming its low pressure black powder propellant by virtue of its low muzzle velocity as shown in Barnes. See Jamison Declaration at p. 2-3, and its attachment (Naramore-Reference BM). Thus, the Winchester cartridge cited by the Examiner cannot generate or withstand the pressures claimed by applicant, a conclusion which the Examiner does not appear to contest.

Moreover, there is no indication in the prior art that any cartridge having the dimensions of the .50-95 Winchester could be built to both withstand, and hold enough powder to generate, the claimed pressures. Reinforcing the cited .50-95 Winchester cartridge to increase its pressure-withstanding capability, while maintaining its exterior dimensions, would *decrease the powder capacity* of the cartridge by requiring thicker metal in the base and walls of the cartridge (as confirmed by Naramore), thus decreasing the amount of pressure the cartridge could generate. Adding the claimed extractor groove, moreover, would require even more metal to eliminate the weakening effect of the groove (as also confirmed by Naramore), thereby even further decreasing the powder capacity and pressure-generating capability. The Jamison secondary reference suggests no solution to this problem. The cartridge Jamison used to both generate and withstand the claimed pressures in the secondary reference was a shortened .425 Westley-Richards cartridge

(as shown in reference BY), whose cartridge case is described by Jamison as much longer (2.196 inches) than the 1.92-inch length of the .50-95 Winchester cartridge case of similar diameter (as shown on p. 124 of Barnes), thus giving the Jamison cartridge a larger powder-holding capacity. Hence, following the Jamison teaching to produce higher pressure would require *increasing* the powder capacity of the .50-95 Winchester cartridge. However, strengthening the Winchester cartridge to withstand the higher pressure would incompatibly require *decreasing* its powder capacity, unless it is lengthened beyond the maximum dimensional ratios set forth in claims 22-39 herein. Thus, Jamison fails to suggest a way to modify the .50-95 Winchester to produce a cartridge capable of both generating and withstanding the claimed pressures, compatibly with maintaining its short length to satisfy the claimed dimensional ratios.

The Examiner has not therefore provided any adequate basis for an obviousness rejection of the cartridge claims of Group I. Certainly, Jamison provides no motivation to modify the .50-95 Winchester cartridge, because he suggests no way of modifying that cartridge to obtain the claimed pressure resistance compatibly with the claimed pressure-generating capability. Jamison himself needed a cartridge with a significantly higher powder capacity and length to achieve that result. Therefore, neither Barnes nor Jamison, either alone or in combination, suggests a firearm cartridge of the claimed size and shape that is capable of generating and withstanding internal gas pressures of at least 50,000 psi. The Examiner's rejection of the claims of Group I under 35 U.S.C. § 103(a) is therefore unsupported.

#### **GROUP II-Claims 1-8, 12-17 and 19**

All of the claims of Group II claim a short action firearm having a number of specified structural limitations summarized as follows:

(a) the chamber has a specified shape and dimensions which mate with those of the cartridge specified in the claims of Group I, including being sized for operably and matingly

receiving a cartridge having a projectile with a specific diameter within a range from 0.22 to 0.30 inch;

(b) the chamber is sized for operably receiving and matingly engaging a cartridge free of any protrusion on the cartridge extending radially outwardly beyond the cylindrical shape of the first portion of the chamber (necessitating a cartridge having an extractor groove); and

(c) the chamber is capable of withstanding internal gas pressures of at least about 65,000 psi.

The Examiner appears to take the position that, although the .50-95 Winchester cartridge cannot produce pressures in excess of 28,000 psi, it would nonetheless be obvious in view of Jamison's disclosure of another cartridge that generates in excess of 50,000 psi, to make a chamber sized to fit the Winchester cartridge that is capable of withstanding at least 65,000 psi as claimed, so as to withstand the pressures generated by Jamison's cartridge.

The Examiner again cites Barnes as the primary reference. Barnes fails to disclose the features cited above as Group II limitations (a), (b) and (c) above. Specifically, Barnes fails to disclose or suggest a chamber sized for operably receiving and matingly engaging a projectile within the claim diameter range of 0.22 to 0.30 inch as required by limitation (a). Nor does Barnes disclose or suggest a "chamber being sized for operably receiving a cartridge free of any protrusion on said cartridge extending radially outwardly beyond said cylindrical shape of said first portion of said chamber," as required by limitation (b), since the .50-95 Winchester has a protruding annular rim for gripping by an extractor, instead of an extractor groove. Barnes also does not disclose or suggest a "chamber being capable of withstanding internal gas pressures of at least about 65,000 psi, as required by limitation (c), in view of the demonstrated 28,000 psi maximum pressure capability of the .50-95 Winchester cartridge.

The Examiner argues that, although the .50-95 Winchester cartridge does not produce pressures in excess of 28,000 psi, it would nonetheless be obvious, in view of Jamison's

disclosure, to make a rifle with a chamber sized for the Winchester cartridge, yet capable of withstanding pressures of at least 65,000 psi. *See* Office Action dated July 26, 2004 at p. 2, and Office Action dated February 4, 2005 at p. 2. However, the Examiner has failed to provide a motive, in the prior art, for constructing any rifle sized to matingly chamber the .50-95 Winchester so that the rifle can withstand gas pressures of up to 65,000 psi. The Barnes reference itself indicates that the mating Winchester rifle is a Model '76 rifle which (due to its lever action) is: "... not a strong action, although entirely adequate for a black powder load." And Applicant has already shown, in the foregoing argument regarding the Group I claims, that there is no motivation from the Jamison secondary reference to modify the .50-95 Winchester cartridge to withstand or produce pressures of at least 50,000 psi. Thus, in the absence of a 50,000 psi Winchester cartridge, no one skilled in the art would have seen any desirability for a mating 65,000 psi rifle chamber. The Examiner has failed to show any other prior art cartridge of the claimed dimensions and shape capable of producing and withstanding at least 50,000 psi. In view of the lack of any demonstrated desirability, in the prior art, of making a mating 65,000 psi rifle chamber for the .50-95 Winchester cartridge, a prima facie case of obviousness is lacking. *See* MPEP § 2143.01; *See also In re Fulton*, 391 F.3d 1195, 1200-01, 73 USPQ2d 1141, 1145-46 (Fed Cir. 2004) (stating that there must be some showing in the prior art of the *desirability* of the asserted combination).

In fact, given that the .50-95 Winchester cannot safely withstand pressures exceeding 28,000 psi, providing a rifle that matingly chambers that prior art cartridge and withstands significantly higher pressures would be understood by one of ordinary skill to represent a safety risk, this is because a user might erroneously feel secure in loading a .50-95 Winchester cartridge with higher-energy propellant sufficient to generate a pressure within the pressure resistance of the chamber, but in excess of the pressure resistance of the cartridge, believing that the surrounding chamber would prevent failure of the weaker cartridge case. However, this would be

particularly untrue of a cartridge having no annularly protruding rim, as required by all of the claims of Group II, because such a cartridge requires slots in the chamber walls near the base of the cartridge to enable the insertion of an extractor to grip an extractor groove. Thus, such cartridge does not have complete chamber support in the base area and, if it is too weak in its base area, can rupture at that location when fired regardless of the strength of the chamber. Such a safety risk does not merely negate desirability, but indicates the extreme undesirability of any such pressure mismatch of a chamber and its cartridge.

**REJECTION UNDER 35 U.S.C. 103(a) OVER BARNES IN VIEW OF JAMISON AND IN FURTHER VIEW OF SCHUERMAN**

**Group III-Claims 9, 10, 20 and 21**

These dependent firearm claims are deemed patentable because of the lack of desirability for modifying Barnes in view of Jamison, as explained in the foregoing argument pertaining to the claims of Group II.

**CONCLUSION**

The Examiner's final rejection of the claims under 35 U.S.C. Section 103(a) should be reversed, and the claims should be found patentable.

Respectfully submitted,



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**CLAIMS APPENDIX**

1. A short-action firearm having an elongate chamber and bolt assembly comprising a tubular chamber and a bolt, selectively slidable longitudinally in a sliding direction between a retracted unlocked position and an extended locked position, said bolt providing a locked bolt face when said bolt is in said locked position, said chamber having a first end adjacent to said locked bolt face and a second end defined by a case mouth recess sized for operably receiving a cartridge with a projectile of a specific diameter within a range from 0.22 to 0.30 inch, said chamber being capable of withstanding internal gas pressures of at least about 65,000 psi and being sized to matingly engage said cartridge so as to enable said cartridge to fire in said chamber with sufficient propellant to produce an internal gas pressure of at least 50,000 psi and to operably withstand said pressure, said bolt being capable of inserting said cartridge into said chamber, said chamber having a first portion of substantially cylindrical shape adjacent to said first end and a second portion of a narrower substantially cylindrical shape adjacent to said second end, and a shoulder portion interconnecting said first portion and said second portion, said chamber having an overall length measured from said locked bolt face to said second end of said chamber, said first portion having a first portion inner diameter of at least about 0.53 inch at a location where said first portion interconnects with said shoulder portion, said overall length having a ratio to said first portion inner diameter at said location of no more than about 3.5, said first portion having a first portion length extending between said locked bolt face and said shoulder portion, said first portion length having a ratio to said first portion inner diameter at said location of no more than about 3, said chamber being sized for operably receiving a cartridge free of any

protrusion on said cartridge extending radially outwardly beyond said cylindrical shape of said first portion of said chamber.

2. The firearm of claim 1, said shoulder portion extending at an angle of less than 40° with respect to a longitudinal axis of said chamber.

3. The firearm of claim 2, said shoulder portion extending at an angle of at least 30° with respect to said longitudinal axis.

4. The firearm of claim 1, said shoulder portion extending at an angle of about 35° with respect to a longitudinal axis of said chamber.

5. The firearm of claim 1 wherein said first portion length is less than 1.5 inch.

6. The firearm of claim 1 wherein said first portion length has a ratio to said first portion inner diameter of no more than about 2.5.

7. The firearm of claim 1 wherein said bolt has an extractor sized for operably gripping a rim portion of said cartridge having an outer rim diameter greater than 0.5 inch.

8. The firearm of any one of claims 1-7 and 11, including said cartridge cooperatively engaged with said chamber for firing.

9. The firearm of any one of claims 1-7 and 11 wherein said bolt has an extractor sized for operably gripping a rim portion of said cartridge having an outside diameter substantially no less than said first portion inner diameter at said location so as to insure reliable bolt operation of said firearm.

10. The firearm of any one of claims 1-7 and 11 wherein said bolt has an extractor adjacent to said bolt face, and a channel oriented transversely to said sliding direction of said bolt through which a rim portion of said cartridge is movable transversely to said sliding direction into gripping engagement by said extractor before said cartridge is inserted into said chamber.

11. The firearm of claim 1, said case mouth recess being sized for operably receiving a cartridge with a projectile of a specific diameter within a range from 0.22 to 0.30 inch.

12. A short-action firearm having an elongate chamber and bolt assembly comprising a tubular chamber and a bolt, selectively slidable longitudinally in a sliding direction between a retracted unlocked position and an extended locked position, said bolt providing a locked bolt face when said bolt is in said locked position, said chamber having a first end adjacent to said locked bolt face and a second end defined by a case mouth recess sized for operably receiving a cartridge with a projectile of a specific diameter within a range from 0.22 to 0.30 inch, said chamber being capable of withstanding internal gas pressures of at least about 65,000 psi and being sized to matingly engage said cartridge so as to enable said cartridge to fire in said chamber

with sufficient propellant to produce an internal gas pressure of at least 50,000 psi and to operably withstand said pressure, said bolt being capable of inserting said cartridge into said chamber, said chamber having a first portion of substantially cylindrical shape adjacent to said first end and a second portion of a narrower substantially cylindrical shape adjacent to said second end, and a shoulder portion interconnecting said first portion and said second portion, said chamber having an overall length measured from said locked bolt face to said second end of said chamber, said first portion having a first portion inner diameter at a location where said first portion interconnects with said shoulder portion, said overall length having a ratio to said first portion inner diameter at said location of no more than about 3.5, said first portion having a first portion length extending between said locked bolt face and said shoulder portion, said first portion length having a ratio to said first portion inner diameter at said location of no more than about 3, said bolt having an extractor sized for operably gripping a rim portion of said cartridge having an outer rim diameter greater than 0.5 inch, said chamber being sized for operably receiving a cartridge free of any protrusion on said cartridge extending radially outwardly beyond said cylindrical shape of said first portion of said chamber.

13. The firearm of claim 12, said shoulder portion extending at an angle of less than 40° with respect to a longitudinal axis of said chamber.

14. The firearm of claim 13, said shoulder portion extending at an angle of at least 30° with respect to said longitudinal axis.

15. The firearm of claim 12, said shoulder portion extending at an angle of about 35° with respect to a longitudinal axis of said chamber.

16. The firearm of claim 12 wherein said first portion length is less than 1.5 inch.

17. The firearm of claim 12 wherein said first portion length has a ratio to said first portion inner diameter of no more than about 2.5.

18. The firearm of claim 12, said case mouth recess being sized for operably receiving a cartridge with a projectile of a specific diameter within a range from 0.22 to 0.30 inch.

19. The firearm of any one of claims 12-18, including said cartridge cooperatively engaged with said chamber for firing.

20. The firearm of any one of claims 12-18 wherein said bolt has an extractor sized for operably gripping a rim portion of said cartridge having an outside diameter substantially no less than said first portion inner diameter at said location so as to insure reliable bolt operation of said firearm.

21. The firearm of any one of claims 12-18 wherein said bolt has an extractor adjacent to said bolt face, and a channel oriented transversely to said sliding direction of said bolt

through which a rim portion of said cartridge is movable transversely to said sliding direction into gripping engagement by said extractor before said cartridge is inserted into said chamber.

22. A cartridge for firing in a mating short-action firearm chamber, said cartridge having a projectile with a diameter within a range from 0.22 to 0.30 inch and an elongate tubular case, having a first end defining a substantially circular base with an annular rim and groove, capable of operably withstanding, and having sufficient propellant to fire at, an internal gas pressure of at least 50,000 psi when in said chamber, said case having a second end defining a mouth for insertably receiving said projectile, said case having a first portion of substantially cylindrical shape adjacent to said first end and a second portion of a narrower substantially cylindrical shape adjacent to said second end, and a shoulder portion interconnecting said first portion and said second portion, said case having an overall length extending between said first end and said second end, and said first portion having a first portion diameter of at least about 0.53 inch at a location where said first portion interconnects with said shoulder portion, said overall length having a ratio to said first portion diameter at said location of no more than about 3.5, said first portion having a first portion length extending between said first end and said shoulder portion, said first portion length having a ratio to said first portion diameter of no more than about 3.

23. The cartridge of claim 22, said shoulder portion extending at an angle of less than 40° with respect to a longitudinal axis of said cartridge.

24. The cartridge of claim 22, said shoulder portion extending at an angle of at least 30° and less than 40° with respect to a longitudinal axis of said cartridge.

25. The cartridge of claim 22, said shoulder portion extending at an angle of about 35° with respect to a longitudinal axis of said cartridge.

26. The cartridge of claim 22 wherein said first portion length is less than 1.5 inch.

27. The cartridge of claim 22 wherein said first portion length has a ratio to said first portion diameter of no more than 2.5.

28. The cartridge of claim 22 wherein said rim has an outer rim diameter greater than 0.5 inch.

29. The cartridge of any one of claims 22-28, said cartridge being free of any protrusion extending radially outwardly beyond said cylindrical shape of said first portion of said case.

30. The cartridge of any one of claims 22-28, said rim having an outer rim diameter substantially no less than said first portion diameter at said location so as to insure reliable bolt operation of a firearm.

31. The cartridge of any one of claims 22-28, said case being capable of withstanding said internal gas pressure of at least 50,000 psi when in said chamber without permanent deformation of said groove longitudinally of said case.

32. A cartridge for firing in a mating short-action firearm chamber, said cartridge having a projectile with a diameter within a range from 0.22 to 0.30 inch and an elongate tubular case, having a first end defining a substantially circular base with an annular rim and groove, capable of operably withstanding, and having sufficient propellant to fire at, an internal gas pressure of at least 50,000 psi when in said chamber, said case having a second end defining a mouth for insertably receiving said projectile, said case having a first portion of substantially cylindrical shape adjacent to said first end and a second portion of a narrower substantially cylindrical shape adjacent to said second end, and a shoulder portion interconnecting said first portion and said second portion, said case having an overall length extending between said first end and said second end, and said first portion having a first portion diameter at a location where said first portion interconnects with said shoulder portion, said overall length having a ratio to said first portion diameter at said location of no more than about 3.5, said first portion having a first portion length extending between said first end and said shoulder portion, said first portion length having a ratio to said first portion diameter of no more than about 3, said rim having an outer rim diameter greater than 0.5 inch and said cartridge being free of any protrusion extending radially outwardly beyond said cylindrical shape of said first portion of said case.

33. The cartridge of claim 32, said shoulder portion extending at an angle of less than  $40^\circ$  with respect to a longitudinal axis of said cartridge.

34. The cartridge of claim 32, said shoulder portion extending at an angle of at least  $30^\circ$  and less than  $40^\circ$  with respect to a longitudinal axis of said cartridge.

35. The cartridge of claim 32, said shoulder portion extending at an angle of about  $35^\circ$  with respect to a longitudinal axis of said cartridge.

36. The cartridge of claim 32 wherein said first portion length is less than 1.5 inch.

37. The cartridge of claim 32 wherein said first portion length has a ratio to said first portion diameter of no more than 2.5.

38. The cartridge of any one of claims 32-37, said rim having an outer rim diameter substantially no less than said first portion diameter so as to insure reliable bolt operation of a firearm.

39. The cartridge of any one of claims 32-37, said case being capable of withstanding said internal gas pressure of at least 50,000 psi when in said chamber without permanent deformation of said groove longitudinally of said case.